# A STUDY OF NEW INDUSTRIAL OIL FUEL IN HONG KONG

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# ABSTRACT

The purpose of this research project is to investigate the reaction of the oil fuel consumer towards a new fuel oil concept in response to the Air Pollution Control Ordinance (Fuel Restriction) Regulation 1990 which has set a restriction on the sulphur content.

The data collection method comprises of personal interview guided by a 23-item questionnaire. Out of 1500 oil fuel consumers as identified from the Directory of Hong Kong Industrial 1989, 50 samples from the relevant industries were drawn by stratified disproportionate sampling method.

In this study, the writer has concluded the following :

(1) Although all respondents are aware of the new regulation, only two-third of them believe their industry are concerned about it. This reflects a strong objection to this new regulation from the industrialist viewpoint.

(2) Despite of the enactment of the new regulation, a majority of the fuel oil user will continue to use fuel oil if they possibly can. Environmental issues do not seem to be their concern.

(3) Among all the attributes of the oil fuel, the respondents are more concerned over the fuel cost,

smoke emission, amount of impurities and the compatibility with the equipment. The implication on the environment pollution is not mentioned.

(4) Most factories have a significant expenditure of the fuel which amounts to about 10% of their operating cost. Therefore the respondents are very price conscious.

(5) The new low sulphur fuel oil concept is favorably accepted if the price and quality are the same as that of fuel oil. Should a premium pricing be proposed, a maximum of 20% over that of fuel oil is suggested without a significant effect on the sale.

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## PREFACE

This is perhaps the most challenging part of the three-year MBA programme. However, we found this part most interesting and practical because it not only allowed us to practise what we have learnt in the class but also enabled us to conduct realistic and in-depth market research of the area in which we are interested. We truly believe that this project is invaluable to our work as well as the academic study.

## ACKNOWLEDGMENTS

Many debts have been accumulated since the project started. We are specially grateful to Dr. Speece, who has given us most valuable recommendations and guidance and helped us to improve; to our interviewees, who provided us with lots of useful information that make this study complete and finally to our most efficient secretaries who helped to make this project complete.

# CHAPTER I

## INTRODUCTION

Environmental protection is one of the biggest concerns of the Hong Kong Government in the 1980s. Considerable emphasis has been placed on preventing future environmental problems by ensuring that environmental factors are considered at all stages of the planning process. Environment Protection Department (EPD) is responsible for the strategic planning and the implementation of these matters.

One of the critical issues that the EPD is facing is the air quality control. The long term solution, by all means, is the setting up of the legislation to control the air quality and combat the air pollution. The emission of air pollutants is controlled by the Air Pollution Control Ordinance.

Sulphur dioxide, one of the major air pollutants, is under severe restriction because it not only causes corrosion to the buildings but also threatens the public health. According to the Hong Kong Government White Paper on pollution, the emission of sulphur dioxide will increase over the next decade with the building of new coal-fired power station and the increase in motor vehicle. In 1989, the emission of sulphur dioxide amounted to 219,000 tonnes. Under the current regulation, only the industrial fuel of maximum 1% by weight of sulphur is allowable. However, the limit is further reduced to 0.5% under the new regulation, trying

to slow down the growth in emission.

With the enactment of the new regulation, the writer believes that there is a significant unsatisfied demand for a suitable industrial fuel. Under this belief, the writer attempts to achieve the following objectives in this project:

1. To examine the purchasing behaviour of industrial oil fuel consumers to establish their attitudes to suppliers.
2. To understand their awareness and concerns about the environmental pressure.
3. To establish their knowledge and attitudes to oil fuel quality.
4. To gauge the reactions to the new oil fuel concept.
5. To elicit the premium that the consumer is willing to pay for the environmental protection.

These questions are of particular interest to the writer and his company, Shell, because the writer believes the outcome is very important for the company to secure market share and competitive advantages should the new product be marketed.

# CHAPTER II

## REGULATORY ENVIRONMENT

For the past decade, a lot of aspects have given rise to public concern which include pollution of streams, smoke emission, noise pollution, wastes disposal and air pollution. Our discussion will be focused on the last item which is the theme of the research.

### Air Pollution Control Ordinance

The environmental control is enforced through the Air Pollution Control Ordinance which is a set of regulations setting restrictions on smoke, dust and grit emission. The main purpose of the Ordinance is to control the emission of air pollutants into the atmosphere of Hong Kong from stationary sources. The Ordinance applies to all emissions from any engine, furnace or industrial plant.

### Air Control Zone

In 1986, the EPD conducted an overall review of the existing policies on environmental protection. Ten Air Control Zones (Figure 1) were established for introducing controls over the air pollutants emission. These ten Air Control Zones fall into three categories as following:

Pollution Sensitive Area since 1978 :

Junk Bay

Fanling - Sha Tau Kok

Port Shelter

Tolo Harbour

Pollution Sensitive Area since 1988 :

Harbour

Tsuen Wan - Kwai Chung

Pollution non-sensitive areas

Lantau island

South Hong Kong island - Lamma

Tuen Mun

Yuen Long

For each air control zone, the Environmental Pollution Advisory Committee will establish air quality objectives to ensure the best use of air in the zone in the public interest. Fuel constriction is one of the air quality objectives through which the pollutant emission is controlled.

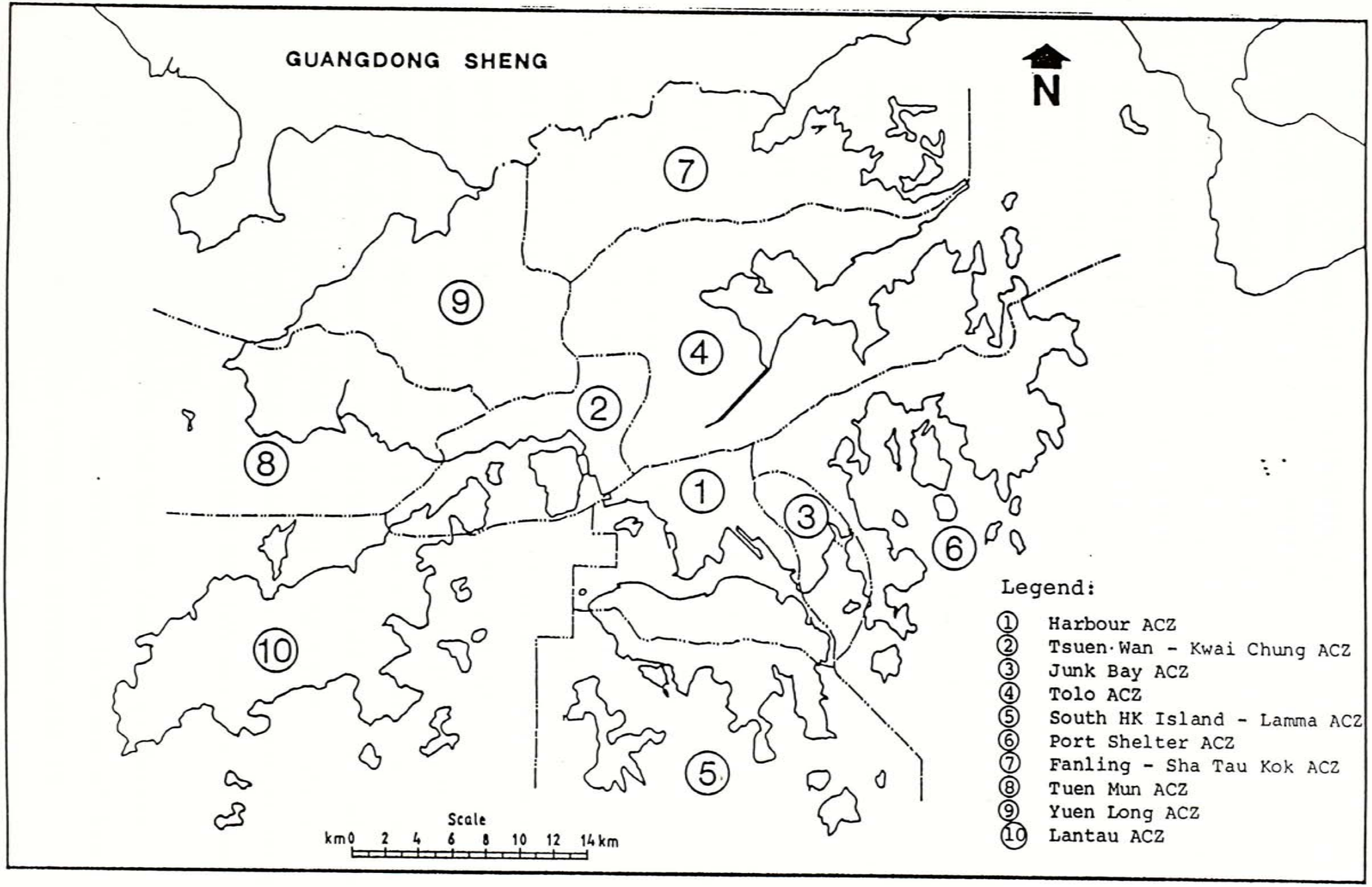


Figure 1 Hong Kong air control zones

## Fuel Oil Consumption in Hong Kong

In late 1970's, a study conducted by the Environmental Protection Agency (now the Environmental Protection Department, EPD) and Royal Observatory revealed that because of topographical constraints and industrial developments, certain areas in Hong Kong were more susceptible to sulphur dioxide pollution. In view of this, the EPD has set up since 1978 a fuel sulphur content restriction in all air pollution sensitive areas. Since an easterly wind prevails for most of the year, the affected areas were on the eastern side of Kowloon and the New Territories.

Under this regulation, all commercial and industrial establishments within the above air pollution sensitive areas are required to fire suitable fuels (lighter gases of fuels with sulphur content less than 1%) in order to prevent air pollutant nuisances. However, modification of existing fuel using plants is not necessary as the restriction applied to new installation of plants only. All fuel using plants installed before 1978 are exempted and will not be required to fire the suitable fuels until alternations or replacements are to be made. Since a 1% sulphur fuel oil was then not available in the Inland Market (there are only two grades offered: Industrial Gas Oil - 0.5%, and Fuel Oil - 2.5% S). As these control areas were not industrially condensed, the impact on both manufacturing and oil industries was not serious at that time.

In the early 1980's the Tai Po Industrial Estate (TPIE) was established. The TPIE falls into one of the air pollution sensitive areas where gaseous and 1% sulphur content fuel are permitted. However, because of

the inavailability of 1% fuel oil at that time, all factories there had to use the cleaner but more expensive IGO even though FO can be used instead. As a result of this, some price conscious customers started to look for a more economical fuel which could meet the sulphur content requirement. Theoretically, a 1% sulphur content fuel can be formed by blending IGO and FO at a ratio of 75 : 25. However, since IGO and FO are both cracked fuels, they were not always compatible. Therefore, most oil companies did not supply blended fuels to the local consumer. As a result, customers with some technical knowledge did the blending themselves in their own premises. According to their experience, there had been occasional blocking of oil filters due to the sludge formed. Nevertheless, the overall performance of mixed fuels was still considered to be tolerable, though not ideal.

In recent years, the industrial/commercial market has become very competitive and few oil companies have begun approaching the users to offer them a blended fuel with 1% sulphur content. They have also guaranteed the qualities of their products are up to the industrial standard and meet the sales specification.

Since 1986 the EPD tried to impose, though without regulation, the 1% sulphur content fuel restriction to new fuel using plants and alternations of existing plants in these two ACZS. However, after a court case in 1987 in which eight factories in Tsing Yi Island won the rule for the use of existing fuel oil, the Government enacted the Air Pollution Control (Furnaces, Ovens and Chimneys) (Installation and Alternation) Regulations in January 1988 which gives the EPD the authority to disapprove the application for licences of boilers and chimneys of

factories if they do not use the suitable fuel. Therefore, in order to obtain licences for their boilers and chimneys, all new factories in these two areas are forced to use a cleaner fuel. As to the existing factories, when they have alternations/replacements of their present boilers and chimneys, they will have to switch to a cleaner fuel too.

To further empower the EPD in exercising air pollution control, the Air Pollution Control (Fuel Restriction) Regulations 1989 was enacted in January, 1989. The fuel restriction areas are in the eastern part of New Territories (Figure 2). With the exception of Shatin, in which only gaseous fuels are to be used, the allowable sulphur content of fuel oil is to be 1% by weight. These regulations formalize the Government's long term standing policy to require the use of clean fuels in topographically restricted areas in Hong Kong.

The current strategy of EPD, as indicated by its Director, Mr. S.B. Reed, is to push the industrialists to use a cleanest fuel available in the market, i.e. a 0.5% sulphur content fuel. In fact, the new Air Pollution Control Ordinance (Fuel Restriction) Regulations 1990 have already been gazetted which limits the sulphur content of fuel oil to be 0.5% by weight. Although the regulation greatly increases the oil expenditure, it is believed the growth of sulphur dioxide emission be limited. Hence, it is apparent that the market demand for a low sulphur fuel oil will emerge.

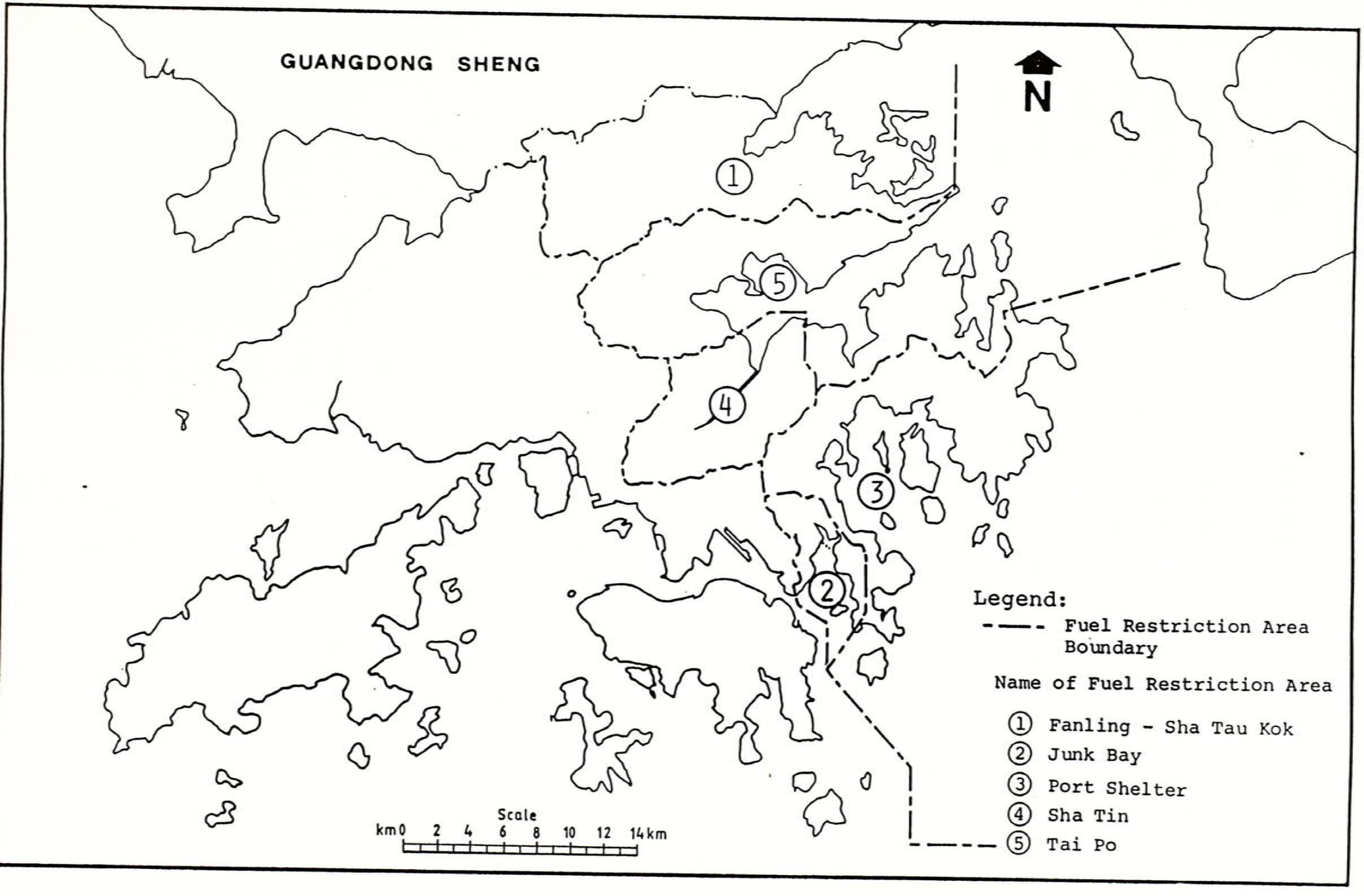


Figure 2 Fuel restriction areas in Hong Kong

TABLE 1

FUEL RESTRICTION AREAS IN HONG KONG

| Area | Category of Fuel Permitted |
|---|---|
| Shatin | Gases only |
| Fanling - Sheung Shui | Gases & 1% sulphur content fuel |
| Junk Bay | Gases & 1% sulphur content fuel |
| Sai Kung, Ho Chung | Gases & 1% sulphur content fuel |
| Plover Cove | Gases & 1% sulphur content fuel |
| Tai Po | Gases & 1% sulphur content fuel |

# CHAPTER III

## CURRENT FUEL OIL MARKET

The fuel oil market in Hong Kong is a low-end one. Because of the commodity nature of the product, the supplier cannot vary the quality of the fuel oil very much. Every supplier have to gain market share by non-price competition.

### Type of Oil Fuel

Currently, there are three major types of oil fuel available in the market which possess different properties :

1. Industrial Gas Oil (IGO)

   IGO is a middle distilled fuel. It is lighter than other available oil fuel in the market. It has a lower sulphur content (0.5%) which is less harmful to the environment and is used for boilers, furnaces and mobile equipment.

2. Fuel Oil (FO)

   Fuel Oil is a residual fuel. It is thicker, more viscous and more difficult to ignite than IGO. It has a higher sulphur content (2.5% - 3%) which can cause air pollution via its smoke emission. Fuel Oil is approximately 40% cheaper than IGO.

3. Blended Oil

   It is a mixture of IGO (25%) and fuel oil (75%). Both its price and quality are in the middle range. It is not stable and probably sludge would be

formed. Blended oil is approximately 30% cheaper than IGO.

4. Low Sulphur Fuel Oil (LSFO)

This is the proposed low sulphur content fuel oil to be introduced in the market. It has almost indentical properties with the existing fuel oil and yet the sulphur content is maximum 0.5% in compliance with the new Air Pollution Ordinance.

Under the Air Pollution Ordinance, all factories within the air pollution sensitive areas are required to use suitable fuels. From the cost viewpoint, the factories will fire the most economic fuel as permitted. As a result, only factories located within Shatin area, which have no other alternatives, have to resort to gaseous oil. Other factories will fire the fuel with permitted sulphur content at minimum cost. Hence, if fuel oil is permitted, no gas oil will be used. The factory only consumes either fuel oil or gas oil but not both.

## Market Share of Oil Fuel

The market is highly competitive because the product itself offers little variations. Every supplier have to depend on the non-price competition to gain market share.

The market is dominated by three brand leaders, namely CRC (China Resources Company), Shell and Esso. It is seen that every major international oil company is present whose market share reflects its marketing strategy and sales effort.

The quality of the industrial fuel oil is measured by the supplier in terms of sulphur content, viscosity, smoke emission, impurity content, water content and pour point. However, like other commodities, fuel oils of the same grade offered by different companies have little variations in quality.

The list prices of the products offered by various suppliers are quite the same via market collusion. In practice, the customers are offered discount and the percentage is largely depends on the relations and the relative bargaining power.

Market strategies also different quite a bit among the supplier which are reflected from the distribution channel. Among all suppliers, CRC, Esso and BP distribute their products mostly through agents while the rest, i.e., Shell, Mobil and Caltex employ direct sales force as well as agents.

None have shown a dominant share in any particular industry. This is explained by the lack of concentrated marketing efforts in any particular industry as learnt by the writer.

TABLE 2

MARKET SHARE OF OIL FUEL SALES

| Supplier | Percentage |
|---|---|
| China Resources | 30.9 |
| Shell | 20.7 |
| Esso | 16.9 |
| Mobil | 12.3 |
| Caltex | 9.7 |
| British Petroleum | 5.4 |
| Others | 5.1 |

Source: writer's internal data

# CHAPTER IV

# METHODOLOGY

## Purpose of the Study

The project is an exploratory study trying to solicit answers for the following questions:

1. What are the oil fuel consumers purchase behavior and their view of suppliers?
2. Do the industrialist pay attention to the new Air Pollution Control Regulation and to what extent?
3. What are their understandings of the oil fuel in the market?
4. What are the acceptance level and reaction of the fuel oil user towards the new product concept?
5. What is the acceptable cost for the environmental protection from the customer's viewpoint?

## Need for the Study

The market share analysis reflects that the fuel oil market is very competitive. Consumer's needs changed as a result of the new regulation. In order to fill up the niche and capture more new customers, the answers are beneficial and useful to the writer and his company, Shell to dominant the market position if such new product is developed.

## Target Respondent

The target respondents are the decision makers of the purchase of the oil fuels of industrial sectors in Hong Kong.

## Population and Sampling

According to the writer's record, the Yellow Pages and the Directory of Hong Kong Industries 1989, there are roughly 1,500 factories which are regular oil fuel consumers. About 60% of them are located at the Pollution Sensitive Area (1988) such as Tsuen Wan and Kwai Chung areas.

In view of the time constraint, the writer decided to draw 50 samples from the population using stratified sampling technique.

The 1,500 factories were firstly classified by their industry and sorted in a ascending order according to their alphabetical names. Samples at a multiple of 30 were drawn which made up our sample list. The make up for the refusals were drawn from the balance.

TABLE 3

INDUSTRY USING OIL FUEL IN HONG KONG

| Industry | approximate number |
|---|---|
| Textile (dyeing and printing) | 1,000 |
| Food and beverages | 160 |
| Metal processing | 350 |
| Paper | 25 |
| Tobacco | 3 |
| | 1,538 |

## Data Collection Method

The data are collected through personal interviews which are conducted face to face to ensure doubts were clarified and no misunderstandings. All interviews were conducted at the working place of the respondent during February and March 1990. The interview was structured and guided by a 23-item questionnaire.

All interviewees were firstly advised by letter to seek for their cooperation and check if the timing is convenient to them. The writer did encounter few refusals because of their companies' policies on information disclosure. However, all the refusals were made up by the remaining population. The writer considered the interview was quite successful probably because some interviewees were really interested in this issue and curious about what the new product was.

# CHAPTER V

# ANALYSIS OF DATA

This chapter summarizes the analysis of the data collected through the personal interviews. The demographic characteristics of the fifty respondents are firstly presented for identification purpose. The current supply situation, environmental concern and the reactions towards the new fuel oil concept are then examined.

## Demographic Characteristics

The demographic characteristics including the position of the respondent, geographical distribution and the industry which are summarized in Table 4.

### Position

Most of the respondents are middle to higher-ranking persons in the factories. 50% of them are owners, managing directors or directors, while staff grades i.e. accountants, engineers or technicians account for 14%. The rest is the middle management. The writer believes their answer should be representative.

### Geographical Distribution

The interviewees were drawn from the ten Fuel Restriction zones of the three Pollution Sensitive Areas.

The writer found most interviewees were located at Pollution Sensitive Area such as Kwai Chung whereas the Pollution Non-Sensitive Area was sparsely populated with factories because of the lack of infrastructure of factories establishment. Consequently, forty one respondents were drawn from Pollution Sensitive Area (1988) six from Pollution Sensitive Area (1978) and the rest from non-sensitive area.

## Industry

As mentioned before, there were roughly 1,500 industrial establishments who were regular consumers of industrial oil fuel. They belongs to five major industries namely textile (dyeing and printing), food and beverages, metal processing and "others". The last one includes paper and tobacco industries.

Since there are 1,000 textile factories regularly using oil fuel, which is about 67% of the total population in our research project, the writer is not surprised to find a corresponding high percentage (70%) of the respondents belonged to this industry.

TABLE 4

DEMOGRAPHIC CHARACTERTICS OF RESPONDENTS

| Position | Frequency | % |
|---|---|---|
| MD/Director/Owner | 25 | 50 |
| Purchasing Manager/Purchaser | 10 | 20 |
| Manager | 8 | 16 |
| Accountant | 4 | 8 |
| Engineer/Technician | 3 | 6 |
| | | |
| Geographical Distribution | | |
| Pollution sensitive since 1978 | | |
| - Junk Bay, Fanling - Sha Tau Kok Port Shelter, Tolo | 6 | 12 |
| Pollution sensitive since 1988 | | |
| - Harbour, Tsuen Wan - Kwai Chung | 41 | 82 |
| Pollution non-sensitive | | |
| - Lantau, South Hong Kong Island, Tuen Mun and Yuen Long | 3 | 6 |
| | | |
| Industry | | |
| Textile (dyeing and printing) | 35 | 70 |
| Food & beverages | 5 | 10 |
| Metal processing | 7 | 14 |
| Others | 3 | 6 |

## User's View on Supplier

This section examines the different aspects of the fuel oil user's view on market.

### Usage of Supplier

84% of the respondents have shown their loyalty and struck to one supplier, either the oil company or agent. The rest adopts multi-suppliers strategy and shifts among a few. However, the low percentage of respondents showing this swing-in-swing-out behavior indicates its uncommonness. According to the writer's personal experience in the industry, most consumers would like to stick to one supplier in order to gain a better bargaining power and establish a better relations. They are generally big spenders of oil fuel. It is also logically to think that they prefer long term gain.

On the other hand, 16% of the respondents which shift among the suppliers are generally small consumers. They tend to be price-shopper seeking short term saving.

The critical issues for the loyalty are pricing, delivery services, product quality and good relations. These attitudes are very important in determining the position of the supplier in the consumers.

TABLE 5

USAGE OF SUPPLIER

| | Percentage |
|---|---|
| Factories shift suppliers | 16 |
| Factories stick to one supplier | 84 |
| Base: All Respondents | (50) |

TABLE 6

ATTRIBUTE ACCOUNTS FOR THE CUSTOMER LOYALTY

| | Percentage |
|---|---|
| Reasonable price | 28 |
| Habitual, no need to change | 20 |
| Good delivery service | 20 |
| Good quality | 12 |
| Good relationship with salesman | 10 |
| Good reputation | 7 |
| Confidence established | 5 |
| Others (Each less than 3%) | |
| Base: Those stick to one supplier | (42) |

Remark : Respondents can answer more than one.

## Type of Supplier

This section gives a better understanding of the oil supply situation. To a certain degree, the data also reveal the marketing channels of the oil companies in general.

60% of the respondents rely on oil company for supply while the rest buys indirectly from the agents. There is no association between the type of supplier and the industry, which shows there is no concentrated marketing effort in any particular industry from either oil company or agent.

However, most respondents who use oil company tend to be heavy consumers. This phenomenon is coincident with what is learnt by the writer. To the best of the writer's knowledge, most oil companies like to deal with the heavy consumers directly for strategic reasons. This type of consumers also appreciate the direct support because of better pricing and direct services. On the other hand, the smaller accounts, which look for flexibility, are left to the agent. The writer also learns that there are gentleman agreements between the oil companies and agents on account responsibilities. Hence, there is no direct conflict between the two parties.

Loyalty is also measured by the years of service. A service life of 5 - 8 years is not uncommon. It shows there are long term relations between customers and their suppliers.

TABLE 7

TYPES OF SUPPLIER

| Factories using : | Frequency | % |
|---|---|---|
| Agent | 20 | 40 |
| Oil Company | 30 | 60 |
| Base: All respondents | (50) | |

TABLE 8

LENGTH OF SERVICE

| | | Total (Years) |
|---|---|---|
| Average length of service by supplier which provided the longest service | | 7.72 |
| Base: All Respondents | (50) | |
| Agents | | 7.0 |
| Base: Those use agent | (20) | |
| Oil Companies | | 8.2 |
| Base: Those use oil co. | (30) | |

## User's Evaluation of Supplier

Fuel oil consumers relying on agents and oil companies have similar ideas about the important attributes of being a good supplier.

Looking at the data collected from the interviews, the writer believes that the ratings of all attributes, maybe with the exception of "salesperson", are equal. As a matter of fact, when the difference of the means is subject to t-test, the above judgement by observation is verified. All ratings, with the exception of "salesperson", are statistically equal at alpha equals to 0.1.

Based on the t-test result of the salesperson ratings, the writer has rejected the null hypothesis that there is no difference between the average scores.That is to say, there is a significant difference between the means of the attribute "salesperson".

It is also worth mentioning that the attribute "salesperson" was rated less important than others by both customers using agents and oil companies. This rather surprised the writer since human assets have always been received the greatest attention in major oil companies and it is believed that business performance of a sales department depends very much on the ability of salespersons.

The writer believes the outcome may be resulted from the company policy. Oil companies, which are multinational concerns, have a well defined rules and procedures, which have little flexibilities. Subject to

these constraints, the consumers of the oil companies are likely to consider the salespersons are just order-takers, or even messengers of their suppliers. There is little that the salespersons can do for them.

On the other hand, agents have to depend largely on customer relations in order to secure their market position. Meanwhile, their customers also treasure such relations with their salespersons in order to gain supports in pricing and product availability. According to the writer's experience, their objectives are achievable because of the lack of bureaucracy and red tapes in small organization. Salespersons do play an important role in fighting the supports for their clients.

Furthermore, the writer also notices that both oil companies and agents are positively evaluated by their respective customers. They are believed to outperform another in every aspect.

As a matter of fact, in order to have a direct control over the heavy consumers, the oil companies like to sell direct and offer them preferential treatments such as prompt delivery. On the other hand, the oil agents have to defense their position by doing the same to their own customers. What have been offered by agents and oil companies are well accepted by their respective customers. This also reflects the successful tactics of the suppliers to secure their positions.

TABLE 9

ATTRIBUTE RATING OF AGENT VS OIL COMPANY
FOR FACTORIES USING AGENT

| (Average Score) | Importance | Agent | Oil Co |
|---|---|---|---|
| Price | 4.5 | 4.4 | 3.9 |
| Quality of Product | 4.5 | 4.5 | 3.8 |
| Value for Money | 4.5 | 4.3 | 4.0 |
| Delivery Terms | 4.5 | 4.5 | 3.8 |
| Service | 4.5 | 4.0 | 3.8 |
| Reliability | 4.3 | 4.3 | 4.0 |
| Reputation | 4.3 | 4.4 | 4.0 |
| Salespersons | 4.2 | 4.4 | 3.6 |

'1' means not important at all

'5' means very important

Base: Those use agent (20)

TABLE 10

ATTRIBUTE RATING OF AGENT VS OIL COMPANY
FOR FACTORIES USING OIL COMPANY

| (Average Score) | Importance | Agent | Oil Co |
|---|---|---|---|
| Price | 4.7 | 3.1 | 4.3 |
| Quality of Product | 4.5 | 3.4 | 4.4 |
| Value for Money | 4.5 | 3.2 | 4.3 |
| Delivery Terms | 4.4 | 3.5 | 4.3 |
| Service | 4.3 | 3.4 | 4.5 |
| Reliability | 4.5 | 3.4 | 4.4 |
| Reputation | 4.5 | 3.3 | 4.5 |
| Salespersons | 3.7 | 3.4 | 4.0 |

'1' means not important at all

'5' means very important

Base: Those use oil company (30)

TABLE 11

T-TEST RESULT OF SALESPERSON RATINGS

| RESPONDENTS USING : | OIL CO | AGENT |
|---|---|---|
| FREQUENCY: | 30 | 20 |
| MEAN SCORE: | 3.7 | 4.2 |
| STD DEV: | 0.62 | 0.81 |

Calculated t-value = 2.417

Degree of freedom = 48

Level of significance = 0.1

Critical t-value = 1.697

The computed t-value is greater than the critical value, the null hypothesis is rejected.

## Attitude to Existing Government Regulation

The current environmental regulations were not strange to the respondents. 79% of the respondents are aware of the existence of government regulations on environment on an unaided basis. However, when they were asked to voice the implication of these regulations, no one mentioned the need for pollution control. Only those direct effects on their operations were mentioned such as 'need to reduce smoke' (90%), 'need to reduce other emissions' (30%) and 'need to change oil fuel' (40%).

The result indicates that the users are not environmental conscious, they only focused on what will be affecting their own operation.

TABLE 12

AWARENESS AND ATTITUDE TO EXISTING

GOVERNMENT REGULATIONS ON ENVIRONMENT

| | Total % | Pollution 1978 % | Sensitive 1988 % | Pollution Non-Sensitive % |
|---|---|---|---|---|
| Total Awareness | | | | |
| Unaided | 78 | 83 | 78 | 67 |
| Aided | 22 | 17 | 22 | 33 |
| Unaided | | | | |
| Need to reduce smoke | 90 | 67 | 93 | 100 |
| Need to reduce other emissions | 30 | 34 | 30 | 33 |
| Need to change oil fuel | 46 | 50 | 48 | - |
| Need to change equipment | - | - | - | - |
| Don't know | - | - | - | - |
| All respondents: | (50) | (6) | (41) | (3) |

Remark : Respondents can tick more than one answer

## Concern Over the Government Regulations

This section evaluates the concerns of the oil fuel consumers over the government regulations, i.e., whether they have paid any attention to this issue.

Most respondents (72%) are aware of the new regulation which restricts the sulphur content of oil fuel to a maximum of 0.5%. However only 64% of them express concerns over the government regulation. Not surprisingly, the most concerned group come from the Pollution Sensitive Areas since 1988 (68%) since they are relatively new to the regulation compared with the industrialists in the Pollution Sensitive Areas since 1978. In addition, most of them are heavy fuel oil users.

36% of the respondents indicate they are not concerned over the new government regulation. They suggest that actual control is not strict and it is difficult for the government to exercise control and to get evidence for prosecution. Their response may be due to the lack of understanding of the details of the fuel restriction regulation (1989), which requires the changeover to a cleaner fuel if any existing fuel-using-plants apply for modification.

TABLE 13

CONCERN ABOUT NEW FUEL RESTRICTION REGULATION

| | Total % | Pollution 1978 % | Sensitive 1988 % | Poll. Non-Sensitive % |
|---|---|---|---|---|
| Awareness | 72 | 67 | 73 | 67 |
| Concern | | | | |
| Yes | 64 | 50 | 68 | 33 |
| No | 36 | 50 | 32 | 67 |
| Aided | | | | |
| Actual control is not strict | 54 | 100 | 46 | 67 |
| Difficult to exercise control | 22 | - | 24 | 67 |
| Difficult to get evidence for prosecution | 8 | - | 10 | - |
| Others | 10 | - | 12 | - |
| Base: | | | | |
| All respondent | (50) | (6) | (41) | (3) |

## Understanding of Different Oil Fuels

This section examines what are considered by the consumers to be quality measurements. Respondents are asked to vote for the advantages and disadvantages of the oil fuel if they agree. Those with highest votes are considered to be the quality measurements because they are considered to be important. The negative side of the attributes are repeated in the disadvantage part to cross check the validity.

Among the advantages and disadvantages, attributes of smoke emission, impurities content and the compatibility with the equipment are highly voted. They are regarded as the quality measurement from the users' viewpoint.

It should be noted that the advantages quoted in Table 14 were given by customers on an unaided basis whereas those quality parameters in Table 15 were given in the questionnaire. From the two tables, we can observe that some of the quality parameters considered important by oil companies, namely, low sulphur content, low viscosity and low pour point, were not mentioned by interviewers.

This again reflects the incomplete product knowledge of customers and thus oil companies should spend more efforts in educating the customers about qualities of different oil fuels.

TABLE 14

UNDERSTANDING OF THE
ADVANTAGES AND DISADVANTAGES OF RESPECTIVE OIL FUEL

| ADVANTAGES | IGO % | Fuel Oil % | Blended Oil % |
|---|---|---|---|
| Less smoke emission | 60 | 4 | 8 |
| Maintain equipment well | 36 | 6 | 4 |
| Less impurities | 40 | - | 14 |
| Less pollution to environment | 26 | - | 12 |
| Less cost | - | 80 | 20 |
| More heat value | 10 | 16 | - |
| Low sulphur content | 6 | - | - |

| DISADVANTAGES | IGO % | Fuel Oil % | Blended Oil % |
|---|---|---|---|
| High cost | 66 | - | 6 |
| Less heat value | 8 | 2 | 2 |
| More smoke emission | - | 32 | 4 |
| More impurities | - | 20 | 8 |
| Pollution environment | - | 16 | 2 |
| High sulphur content | - | 2 | - |

Base: All respondents (50)

TABLE 15

ATTITUDE TO DIFFERENT OIL FUELS

| | Gas Oil | Fuel Oil | Blended Oil |
|---|---|---|---|
| Has Low Sulphur Content | 4.5 | 2.4 | 3.2 |
| Has Low Viscosity | 4.4 | 2.5 | 3.4 |
| Elicit Few Smoke Emissions | 4.3 | 2.6 | 3.3 |
| Contains Few Impurities | 4.4 | 2.3 | 3.2 |
| Has Low Water Content | 4.3 | 2.6 | 3.3 |
| Has Low Pour Point In Winter | 4.3 | 2.3 | 3.2 |

'1' means strongly disagree

'5' means strongly agree

Base: All respondents (50)

## Knowledge of Sulphur Content

This section examines the user's understanding of sulphur content in oil fuel as a measure of their product knowledge.

When specifically asked about the sulphur content of different oil fuels, the writer finds that the respondents' knowledge on sulphur content is limited. Most of them cannot state, or incorrectly state, the sulphur content for gas oil, fuel oil or blended oil.

Nevertheless, they realize that IGO has the lowest sulphur content, fuel oil, the highest while blended oil is in between.

TABLE 16

KNOWLEDGE OF SULPHUR CONTENT

| Sulphur Content | Gas Oil % | Fuel Oil % | Blended Oil % |
|---|---|---|---|
| 0.5% or less | 10* | - | - |
| 0.6% - 1% | 20 | - | 10* |
| 1.1% - 2% | 2 | 18 | 14 |
| 2.1% - 2.5% | 2 | 22 | 4 |
| 2.6% - 3% | - | 2* | 2 |
| Over 3% | - | 2 | - |
| Don't Know | 66 | 56 | 70 |

* .. correct answer

Base: All respondents (50)

## Expenditure on Oil Fuel

It is noticed from the survey that the monthly consumption of IGO users is much lower than that of fuel oil or blended oil users, this may be one of the reasons why they can afford to use IGO other than some technical requirements.

Fuel oil and blended oil users, both are heavy users of oil fuels, spend as much as 10% of their total operating cost on oil fuels. As a result, they are very price sensitive and very reluctant to switch the fuel.

In addition, changing oil fuel also means the alternation of certain equipment, which implies a large cost outlay. Together with the large volume consumption, it is not surprising to find industrialists not switching their oil fuel even if they are aware of government regulations.

TABLE 17

EXPENDITURE ON OIL FUEL

| | Gas Oil | Fuel Oil | Blended Oil |
|---|---|---|---|
| Average Price (HK$/litre) | 1.8 | 1.28 | 1.64 |
| Average Volume (litre/month) | 29,370 | 85,680 | 42,130 |
| Average Expenditure (HK$/month) | 43,250 | 101,570 | 50,373 |
| Relative Ratio (expand/IGO) | 1.00 | 2.35 | 1.16 |
| Average % of Total Expenditure | 8.9 | 10.4 | 12.0 |
| Base: All Respondents | 7 | 40 | 3 |

# CHAPTER VI

## POTENTIAL OF NEW PRODUCT

This section discusses if there is any potential of the new fuel oil product.

### Willingness to Switch Product

The fuel oil consumer's willingness to change the fuel as a result of the new regulation is examined in this chapter.

According to the new air pollution regulation, the existing fuel oil of 2.5 - 3% sulphur cannot be used. However, 85% of the respondents do not respond to it and continue to fire the fuel oil. Only 10% of them will upgrade to IGO. This indicates the great resistance user to this regulation.

In analysing the response by pollution sensitive area; the writer finds that the major shift comes from the Pollution Sensitive Area (1978), 67% of the respondents using fuel oil will shift to gas oil to comply the new regulation.

It shows the respondent from this area is more receptive to the new regulation and willing to upgrade the fuel. This is because the respondents located at this area have long been operating under the fuel restriction regulation and have a better appreciation of the law. However, the sample number is too small to draw a representative interpretation.

90% of the respondents in the Pollution Sensitive area (1988) are indifferent to the regulation. Only 5% of them will switch to IGO. The great reluctance is explained by the relatively large consumption of the fuel oil in this area, which makes the user very price sensitive.

Respondents from non-pollution sensitive area will use whatever they are currently using. This is understandable because the regulation does not apply to them. Hence, they are indifferent to the new regulation.

Generally speaking, a majority of the fuel oil user will not upgrade the fuel if they possibly can. Furthermore, all blended oil consumers will continue to fire the blended oil. Only if the EPD closely monitor the situation or else the industrialist will not upgrade the fuel in order to meet the fuel restriction requirement out of their own initiative.

TABLE 18.1

PRODUCT SWITCH

ALL RESPONDENTS

| | | CURRENT | | |
|---|---|---|---|---|
| | | Gas Oil | Fuel Oil | Blended Oil |
| FUTURE | Gas Oil | 7 (100%) | 4 (10%) | 1 (33%) |
| | Fuel Oil | - | 34 (85%) | - |
| | Blended Oil | - | 2 (5%) | 2 (67%) |

Base: All Respondents (50)

TABLE 18.2

PRODUCT SWITCH

POLLUTION SENSITIVE AREA SINCE 1978

| | | CURRENT | | |
|---|---|---|---|---|
| | | Gas Oil | Fuel Oil | Blended Oil |
| FUTURE | Gas Oil | 2 (100%) | 2 (67%) | - |
| | Fuel Oil | - | 1 (33%) | - |
| | Blended Oil | - | - | 1 (100%) |

Base: Pollution sensitive area starting 1978 (6)

TABLE 18.3

PRODUCT SWITCH

POLLUTION SENSITIVE AREA SINCE 1988

| | | CURRENT | | |
|---|---|---|---|---|
| | | Gas Oil | Fuel Oil | Blended Oil |
| FUTURE | Gas Oil | 4 (100%) | 2 (5%) | - |
| | Fuel Oil | - | 32 (90%) | - |
| | Blended Oil | - | 2 (5%) | 1 (100%) |

Base: Pollution sensitive area starting 1988 (41)

TABLE 18.4

PRODUCT SWITCH

POLLUTION NON-SENSITIVE AREA

| | | CURRENT | | |
|---|---|---|---|---|
| | | Gas Oil | Fuel Oil | Blended Oil |
| FUTURE | Gas Oil | 1 (100%) | - | - |
| | Fuel Oil | - | 1 (100%) | - |
| | Blended Oil | - | - | 1 (100%) |

Base: Pollution non-sensitive area (3)

## Reaction to New Fuel Oil Concept

This section examines the oil fuel users' reaction towards the new product which will content maximum 0.5% sulphur.

The users' reaction is operationally defined by the purchase interest level, which is gauged by the percentage of respondents showing "very interested" and "quite interested" in the question. The reaction is examined under three scenarios:

1. neither pricing nor supplier's name is mentioned.
2. only supplier's name i.e. Shell is mentioned.
3. only pricing (versus that of fuel oil) is mentioned.

The reason why these scenarios were set is because the writer would like to know if the brand name, Shell helps in the new product development and the premium that the product can possibly command.

The result shows the interest level is as high as 60% if neither price nor supplier's name is mentioned. The result is very encouraging. However, the percentage only increased by 4 points if it is identified as Shell product. The writer believes the high price perception of the product has outweighed the brand name although no price is ever mentioned.

When the price is more explicitly expressed as a premium versus fuel oil in the order of 0%, 10%, 20%, 30% and 40%, the purchase interest drops from 90% to finally 2%. When the writer compares scenario 2 and 3, it shows that pricing has outweighed the supplier factor in the determination of the purchase interest.

The interest level continues to drop as the premium increases. A sharp decrease is noticed at 30% premium.

The most significant drop out comes from the Pollution Sensitive Area (1988) which are generally heavy consumers. Furthermore, the respondents from this area shows a higher pricing sensitivity than the others as well.

When the pricing issue is put forth to Shell customers and non-Shell customers under the scenario that Shell will withdraw the existing brand and market the new fuel product, a similar conslusion is drawn.

If the price is the same as that of fuel oil, all Shell customers will switch to the new Shell brand. Furthermore, a significant proportion (82%) of non-Shell customers will turn to Shell, meaning that the new product, with the support from Shell, is able to capture a lot of new customers. As the premium gradually increases, the Shell customers will switch to the competition probably because of the pricing. More non-Shell customers will stick to their own brand too. The sharp decrease is also found at 30% premium which confirms the previous finding.

The writer believes the 20% premium over the fuel oil is the maximum that the new product can command. This is supported by the significant reduction in purchase interest at this point. This ties in with the fact that the higher priced IGO is about 40% more expensive than fuel oil and blended oil, 30% more. If the price is 30% more expensive, fuel users may as well buy IGO, the best quality product currently available.

Secondly, the result also indicates the price that the users willing to pay for a cleaner environment under the new regulation. They may consider 30% more is too much for them to pay, or they would have shifted to IGO already.

TABLE 19.1

REACTION TO NEW PRODUCT CONCEPT
PRICING & COMPANY NAME MENTIONED

| | Total % | Pollution 1978 % | Sensitive 1988 % | Pollution Non-Sensitive % |
|---|---|---|---|---|
| Scenario 1 : | 60 | 60 | 64 | 33 |
| Scenario 2 : | 64 | 60 | 67 | 50 |
| Scenario 3 : Price vs fuel oil | | | | |
| The same | 90 | 80 | 100 | 33 |
| +10% | 76 | 60 | 84 | 33 |
| +20% | 54 | 40 | 62 | 17 |
| +30% | 10 | 20 | 10 | - |
| +40% | 2 | - | 4 | - |
| Respondents | (50) | (6) | (41) | (3) |

TABLE 19.2

REACTION TO NEW PRODUCT CONCEPT
SHELL USERS/NON SHELL USERS

| | The Same | +10% % | +20% % | +30% % | +40% % |
|---|---|---|---|---|---|
| Switch to new Shell brand | 100 | 78 | 61 | 28 | 7 |
| Switch to non-Shell brand | - | 22 | 39 | 72 | 93 |
| Base: All Shell Users | (28) | | | | |
| Stick to existing brand | 18 | 27 | 41 | 77 | 96 |
| Switch to new Shell brand | 82 | 73 | 59 | 23 | 4 |
| Base: All Non-Shell Users | (22) | | | | |
| Total switch to new Shell brand | 92 | 76 | 60 | 26 | 6 |
| Base: All Respondents | (50) | | | | |

# Chapter VII

## SUMMARY

1. The majority of the oil fuel consumer have only one supplier. The important attributes account for their loyalty are pricing, habitual buying and delivery services.
2. Besides the oil company, agent serves the market pretty good and is well evaluated by its customers. As a matter of fact, customers of oil company and agent have similar ideas of the attribute importance of being a good supplier.
3. Though the total awareness of the regulatory environment reaches 100%, the respondents only pay attention to what are going to affect their operation, environmental implication is not mentioned.
4. Despite most respondents are aware of the new environmental regulation, about half of them believe their industry are not concerned or not paying attention to this issue. They also believe the control is not strict.
5. Smoke emission, impurity content and compatibility with the equipment are considered to be the quality measurements by the consumers. However, those measurements are not comprehensive from the supplier's viewpoint.

6. Although the consumers understand the general properties of the various types of oil fuel, the most important parameter, sulphur content, is not accurately known by all users.
7. Obviously the oil fuel consumers do not fully understand the details of the new Air Pollution (Fuel Restriction) Regulation. 85% of the fuel oil users believe they will continue to use the existing product disregarding the fact that it is legitimately not allowed.
8. The expenditure of oil fuel is in the range of HK$50,000 to 100,000. This amounts to about 10% of the total operating expenditure. The high percentage accounts the price sensitive behavior.
9. Without any mentionings on pricing and supplier, the new fuel oil is very well accepted by the user. Furthermore, the pricing issue is much more important than the supplier factor in the purchase interest level. At the same price of the existing fuel oil, the new product can arouse a high level of purchase interest. However, should the premium pricing strategy be adopted, the maximum that the product can command is 20% versus fuel oil.
10. It also shows that the price that the user willing to pay for the environmental protection is just 20% more, or else the consumer have already used IGO.

# CHAPTER VIII

## CONCLUSION

This project is an exploratory study of the industrial oil fuel consumer behavior, their attitude towards the regulatory environment and their reactions to the new product.

The writer hopes the project is useful in capturing the market under the new pollution regulation. Using these findings, Shell secure their existing customers by offering this improved product and to improve their market share by attracting new customers. Since the environmental pressures are likely to increase, the one that is the first in the market with such low sulphur content fuel product will secure competitive advantage.

APPENDIX 1

RESPONDENT COMPANY LIST

TEXTILES

1. First Dyeing Works Ltd
2. Kong Sun Dyeing Ltd
3. King Win Dyeing Ltd
4. Meying Dyeing Works Ltd
5. Northwood Limited
6. South China Bleaching & Dyeing Ltd
7. Winsor Industrial Corporation Ltd
8. Winner Company (Texturizing) Ltd
9. Trend Choice Dyeings Ltd
10. Golden Fund Dyeing Co Ltd
11. Hing Fung Printing and Dyeing Ltd
12. Milo's Knitwear Factory Ltd
13. HK Multi-Fibres Work Ltd
14. Lai Sun Garment
15. Luen Ming Fung
16. Manhattan Garments
17. Nanyang Cotton Mills
19. Wing Wah Dyeing Factory
20. Wing Hop Fong Dyeing and Weaving
21. Yuen Long Textiles
22. Island Dyeing and Printing
23. Cosmo Textile Company
24. China Dyeing Company
25. Taltex Co Ltd
26. Fortune Company Ltd

27. Pacific Dyeing Company
28. Fountain Set Ltd
29. Perfecta Dyeing Ltd
30. Kien Fu Dyeing Ltd
31. Mou Fung Dyeing Ltd
32. Uniform Textile Ltd
33. Skien Dyeing Works Ltd
34. Easey Garment Factory Ltd
35. Tai Yip Dyeing Ltd

FOOD & BEVERAGES

1. Winner Foods Manufacturer Co Ltd
2. Dairy Farm Group
3. Ching Shan Food
4. Excelsior Hotel
5. Yeo Hiap Seng
6. San Miguel Brewery
7. Nissin Food

METAL PROCESSING

1. Metalex Ltd
2. Chiaphua Shinko
3. Meyer Aluminium
4. Modern Metal Refining
5. Nippon Hume

OTHERS

1. YKK Zipper
2. Tai Hing Paper
3. Nanyang Brothers

APPENDIX 2

NEW FUEL OIL RESEARCH

NAME OF RESPONDENT : _____

TITLE/POSITION : _____

NAME & ADDRESS OF COMPANY : _____

_____

_____

TELEPHONE NO : _____

DATE OF INTERVIEW : _____

---

Good morning/afternoon. (Self-introduction). Thank you very much for participating in this survey. This survey is about fuel usage and will help us better understand your needs in order to better serve you in the near future.

A. Are you responsible for the purchase of fuel for your company?

| | |
|---|---|
| Yes ..... | 1 |
| No ..... | 2 |

B. CODE AREA

POLLUTION SENSITIVE AREAS (STARTING FROM 1978)

| | |
|---|---|
| Junk Bay | 1 |
| Fanling - Sha Tau Kok (regrouped from 'Fan Ling, Sheng Shui') | 2 |
| Port Shelter (regrouped from 'Sai Kung, Ho Chung') | 3 |
| Tolo (regrouped from Tai Po, Plover Cove, Shatin, Tai Mo Shan) | 4 |

| | |
|---|---|
| POLLUTION SENSITIVE AREAS (STARTING FROM 1988) | |
| Harbour (regrouped from: | 5 |
| - Hong Kong Island North i.e. Shaukeiwan, North Point, Causeway Bay, Wanchai, Central, Sai Ying Pun, Kenneday Town | |
| - Kwoloon East i.e. Hunghom, To Kwan Wan, Kowloon City, Wong Tai Sin, Tse Wan Shan, San Po Kong, Ngau Tau Kok, Kwun Tong, Yau Tong, Kowloon Tong | |
| - Kowloon West i.e. Sham Shui Po, Cheung Sha Wan, Mongkok, Yaumatei, Tsimshatsui) | |
| Tsuen Wan - Kwai Chung | 6 |
| (regrouped from Tsuen Wan, Kwai Chung, Tsing Yi, Tai Lam, Lok On Pai) | |
| POLLUTION NON-SENSITIVE AREAS | |
| Lantau Island | 7 |
| South Hong Kong Island - Lamma (regrouped from Aberdeen, Stanley, Ap Lei Chau, Lamma Island) | 8 |
| Tuen Mun | 9 |
| Yuen Long (regrouped from Kam Tin, Shek Kong, Pat Heung, Yuen Long, Lau Fau Shan, Leung Kwa Tan) | 0 |
| C. CODE INDUSTRY | |
| Textile | 1 |
| Food & Beverages | 2 |
| Metal Processing | 3 |
| Tobacco | 4 |
| Others | 5 |

USAGE OF OIL FUEL

First, we would like to know your usage of oil fuel.

1. Which grade/kind of oil fuel are you currently using?

| | |
|---|---|
| Gas oil/IGO/Industrial diesel/Red diesel | 1 |
| Fuel oil | 2 |
| Blended oil | 3 |
| Others (write) _____ | |

2. Which one did you previously use?

| | |
|---|---|
| The same | 1 |
| Gas oil/IGO/Industrial diesel/Red diesel | 2 |
| Fuel oil | 3 |
| Blended oil | 4 |
| Others (write) _____ | |

| IF Q2 DIFFERENT FROM Q1 |
|---|

3. Why did you make the change?

_____

_____

_____

4. What are the advantages and disadvantages of:-

Gas oil/IGO

Fuel oil

Blended oil

Any others? PROBE: effects on machine/boiler/furnace
effects on environment
pricing

Gas oil/IGO

Advantages : _____

_____

Disadvantages : _____

_____

Fuel Oil

Advantages : _____

_____

Disadvantages : _____

_____

Blended Oil

Advantages : _____

_____

Disadvantages : _____

_____

5. On a scale of 1 to 5, '1' meaning disagree strongly, '5' meaning agree strongly, please tell me your attitudes towards the different attributes relating to:

| Attributes | Gas Oil | Fuel Oil | Blended Oil |
|---|---|---|---|
| Has low sulphur content | _____ | _____ | _____ |
| Has low viscosity | _____ | _____ | _____ |
| Elicit few smoke emission | _____ | _____ | _____ |
| Contain few impurities | _____ | _____ | _____ |
| Has low water content | _____ | _____ | _____ |
| Has low pour point in winter | _____ | _____ | _____ |

6. Can you please tell me the sulphur content in percentage terms of:

| Sulphur Content | Gas Oil | Fuel Oil | Blended Oil |
|---|---|---|---|
| Unaided | | | |
| 0.5% or less | 1 | 1 | 1 |
| 0.6% - 1% | 2 | 2 | 2 |
| 1.1% - 2% | 3 | 3 | 3 |
| 2.1% - 2.5% | 4 | 4 | 4 |
| 2.6% - 3% | 5 | 5 | 5 |
| Over 3% | 6 | 6 | 6 |
| Don't know | 0 | 0 | 0 |

PRICING

Now I would like to ask you a few questions on pricing.

7. What is the average price per litre after discount of oil fuel you currently use?

| | |
|---|---|
| Gas oil/IGO | _____/litre |
| Fuel oil | _____/litre |
| Blended oil | _____/litre |

8. On average, what is the consumption level of oil fuel per month of your company/factory? What about the total expenditure?

| | Volume (litre) | Expenditure (HK$) |
|---|---|---|
| Gas oil/IGO | | |
| Fuel oil | | |
| Blended oil | | |

9. On average, what percentage does the oil fuel cost account for out of the total operation expense?

_____ %

PURCHASING

I would like to discuss with you on your purchasing habits:

10. From how many suppliers do you currently purchase oil fuel?

_____

11. Generally speaking, do you shift from one supplier to another or do you stick to one or a few consistently?

| | |
|---|---|
| Shift | _____ |
| Stick to one or a few | _____ |

12. Why do you shift/stick to one or a few?

_____

_____

13. a. On a 5-point scale, '1' terrible, '5' meaning excellent, how would you rate an agent and an oil company on overall performance as a supplier of oil fuel?

| | Agent | Oil Company |
|---|---|---|
| Overall performance | _____ | _____ |

b. On a 5-point scale, '1' meaning not good at all, '5' meaning very good, how would you rate an agent and an oil company as a supplier of oil fuel on the following attributes?

c. And how would you rate on a 5-point scale, '1' meaning not important at all, '5' meaning very important, the factors which influence your choice of a supplier?

| | Q13 b | | Q13 c |
|---|---|---|---|
| | Agent | Oil Co | Importance |
| Delivery Terms | _____ | _____ | _____ |
| Service | _____ | _____ | _____ |
| Quality of Product | _____ | _____ | _____ |
| Value for Money | _____ | _____ | _____ |
| Reputation | _____ | _____ | _____ |
| Reliability | _____ | _____ | _____ |
| Salesperson | _____ | _____ | _____ |
| Price | _____ | _____ | _____ |

14. a. Do you use an agent? Yes _____ No _____

b. How many? _____

c. What agent or agents? _____

_____

_____

d. Which brands? _____

_____

15. a. Do you use an oil company? Yes _____ No _____

b. How many? _____

c. Which oil company or companies

_____

_____

16. a. How long have you used the supplier which provided you with the longest service?

| | | |
|---|---|---|
| less than 1 year | _____ | 1 |
| 1 - 2 years | _____ | 2 |
| 2 - 3 years | _____ | 3 |
| 3 - 4 years | _____ | 4 |
| 4 - 5 years | _____ | 5 |
| more than 5 years | _____ | 6 |

b. Was it an agent or an oil company?

| | | |
|---|---|---|
| Agent | _____ | 1 |
| Oil company | _____ | 2 |

ENVIRONMENTAL ISSUES

Now, I would like to discuss with you certain environmental concerns the government has.

17. a. Are you aware of any government regulations on the environment which affect your industry?

| | | |
|---|---|---|
| Yes | _____ | 1 |
| No | _____ | 2 |

--------
IF YES
--------

b. Can you tell me what they are?

Unaided

| | |
|---|---|
| Need to reduce smoke | 1 |
| Need to reduce other emissions | 2 |
| Need to change oil fuel | 3 |
| Need to change equipment | 4 |

18. a. Are you aware that the government has introduced a regulation to restrict the usage of oil fuels more than 1% of sulphur content in certain areas?

| | |
|---|---|
| Yes _____ | 1 |
| No _____ | 2 |

b. Do you think the industry is concerned about this government regulation?

| | |
|---|---|
| Yes _____ | 1 |
| No (Go To 19c) | 2 |

c. Why?

Any others not on the list?

Aided

| | |
|---|---|
| Actual exercise of control is not strict | 1 |
| Difficult for Government to exercise control | 2 |
| Difficult for Government to get evidence to prosecute offenders | 3 |
| Others | 4 |

_____

_____

19. Are you aware that a new Air Pollution Control Regulations has been gazetted which requires all fuel using plants to burn liquid fuel with a maxium sulphur content of 0.5% by weight.

| | |
|---|---|
| Yes _____ | 1 |
| No _____ | 2 |

---

ASK CODE AREA B: 1,2,3,4, POLLUTION SENSITIVE AREA (STARTING 1978)

---

20. a. Do you intend to shift to a blended oil in the near future?

| | | |
|---|---|---|
| Yes | _____ | 1 |
| No | _____ | 2 |

---

ASK CODE AREA B: 5,6,7,8,9,10 POLLUTION SENSITIVE AREA (STARTING 1988) AND NON-SENSITIVE AREAS

---

b. Do you intend to shift to a READ in the future? Any others not mentioned here?

| | | |
|---|---|---|
| Gas oil/IGO | _____ | 1 |
| Blended oil | _____ | 2 |
| Others | _____ | 3 |

21. If there is a new oil with sulphur content less than 0.5%, and the quality is stable with no adverse effect to your boiler/furnace and is actually to same as that of fuel oil,

a. Would you be interested or not in purchasing it?

| | | |
|---|---|---|
| Very interested | _____ | 5 |
| Quite interested | _____ | 4 |
| Average | _____ | 3 |
| Not quite interested | _____ | 2 |
| Not interested at all | _____ | 1 |

b. If it is launched by Shell, would you be interested in purchasing it?

| | | |
|---|---|---|
| Very interested | _____ | 5 |
| Quite interested | _____ | 4 |
| Average | _____ | 3 |
| Not quite interested | _____ | 2 |
| Not interested at all | _____ | 1 |

22. How much are you willing to pay more for it comparing to ordinary fuel oil? On a 5-point scale, '1' meaning not interested at all, '5' meaning very interest, please indicate your interest level.

| % willing to pay more | Score | | | | |
|---|---|---|---|---|---|
| 50% | 1 | 2 | 3 | 4 | 5 |
| 40% | 1 | 2 | 3 | 4 | 5 |
| 30% | 1 | 2 | 3 | 4 | 5 |
| 20% | 1 | 2 | 3 | 4 | 5 |
| 10% | 1 | 2 | 3 | 4 | 5 |
| The same | 1 | 2 | 3 | 4 | 5 |

23. As a result of Shell launching this new product, alongside with its existing fuel oil, would you READ OUT if it was:

| Price Differential | a | | b | | c | | d | | e | | f | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Users | 50% | | 40% | | 30% | | 20% | | 10% | | Same | |
| FOR SHELL USERS | YES | NO | YES | NO | YES | NO | YES | NO | YES | NO | YES | NO |
| Switch to new Shell brand | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| Switch to non Shell brand | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| NON SHELL USERS | | | | | | | | | | | | |
| Stick to existing brand | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| Switch to new Shell brand | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| Any switch to new Shell brand | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |

T H A N K  Y O U  F O R  Y O U R  C O - O P E R A T I O N !!

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